US Army Corps
of Engineers
Alaska District

Public Notice of Application for Permit

Regulatory Division (1145)
CEPOA-RD
Post Office Box 6898
Elmendorf AFB, Alaska 99506-0898

PUBLIC NOTICE DATE: April 17, 2007

EXPIRATION DATE: May 17, 2007

REFERENCE NUMBER: POA-2006-37-2

WATERWAY: Passage Canal

Interested parties are hereby notified that a Department of the Army permit application has been received for work in waters of the United States as described below and shown on the enclosed project drawings.

APPLICANT: Alaska Railroad Corporation, Post Office Box 107500, Anchorage, Alaska 99510.

LOCATION: The project site is located within Sections 13 and 24, T.8 N., R. 4 W., Seward Meridian; USGS Quad Map Seward D-5; Latitude 60.777° N., Longitude 148.682° W.; in Whittier, Alaska.

PURPOSE: The applicant's stated purpose is removal of a condemned dock that is in danger of collapsing due to corrosion of the steel piles.

PROPOSED WORK: The applicant is proposing a two phase project to replace the Marginal Wharf in Whittier, Alaska.

Phase 1: Demolition of the existing 60- by 1,100-foot wharf and two tower dolphins (located at the west end of the wharf) using heavy equipment from the shore and on a barge. After demolition of the wharf the applicant anticipates that the portions of the existing sheet pile wall will require additional support. Therefore up to 1,500 cubic yards and 3,000 cubic yards of rip rap would be placed in a maximum of 0.65 acres located below the high tide line (HTL) to buttress the sheet pile wall.

Phase 2: Construction of a combination sheet pile fill pad (measuring 75 by 800 feet) and floating dock (measuring 50 by 150 feet). A total of 75,000 cubic yards of fill would be placed to construct the fill pad and up to 1.5 acres located below the HTL would be impacted as a result of this construction. Although, this portion of the project is not yet scheduled due to funding restrictions, the Corps is required to evaluate the total impacts of the project; therefore we are including this in our evaluation.

See the attached project description for additional information.

ADDITIONAL INFORMATION: The material created from the demolition would be temporarily stockpiled upland area for future reuse and/or recycling, with the exception for 3,500 cubic yards of concrete and embedded steel material that would be used to construct an artificial reef structure.

MITIGATION: The applicant proposes to utilize approximately 3,500 cubic yards of concrete and embedded steel material created during the demolition of the wharf to construct an artificial reef structure adjacent to the wharf in up to 2.0 acres of sub tidal habitat. See the attached "Whittier Artificial Reef Proposal" for additional information regarding the proposed mitigation project. The applicant also proposes to complete the demolition work and reef construction between October 1 through March 1 and/or during low tidal stages.

WATER QUALITY CERTIFICATION: A permit for the described work will not be issued until a certification or waiver of certification, as required under Section 401 of the Clean Water Act (Public Law 95-217), has been received from the Alaska Department of Environmental Conservation.

COASTAL ZONE MANAGEMENT ACT CERTIFICATION: Section 307(c)(3) of the Coastal Zone, Management Act of 1972, as amended by 16 U.S.C. 1456(c)(3), requires the applicant to certify the described activity affecting land or water uses in the Coastal Zone complies with the Alaska Coastal Management Program. A permit will not be issued until the Office of Project Management and Permitting, Department of Natural Resources has concurred with the applicant's certification.

CULTURAL RESOURCES: The latest published version of the Alaska Heritage Resources Survey (AHRS) has been consulted for the presence or absence of historic properties, including those listed in or eligible for inclusion in the National Register of Historic Places. There are no listed or eligible properties in the vicinity of the worksite. Consultation of the AHRS constitutes the extent of cultural resource investigations by the District Commander at this time, and he is otherwise unaware of the presence of such resources. This application is being coordinated with the State Historic Preservation Office (SHPO). Any comments SHPO may have concerning presently unknown archeological or historic data that may be lost or destroyed by work under the requested permit will be considered in our final assessment of the described work.

ENDANGERED SPECIES: Preliminarily, the described activity will not affect threatened or endangered species, or modify their designated critical habitat, under the Endangered Species Act of 1973 (87 Stat. 844). This application is being coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (NMFS). Any comments they may have concerning endangered or threatened wildlife or plants or their critical habitat will be considered in our final assessment of the described work.

ESSENTIAL FISH HABITAT: The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with the NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). Preliminarily, the described activity may affect EFH in the project area. This Public Notice initiates EFH consultation with the NMFS. Any comments or recommendations they may have concerning EFH will be considered in our final assessment of the described work.

TRIBAL CONSULTATION: The Alaska District fully supports tribal self-governance and government-to-government relations between Federally recognized Tribes and the Federal government. Tribes with protected rights or resources that could be significantly affected by a proposed Federal action (e.g., a permit decision) have the right to consult with the Alaska District on a government-to-government basis. Views of each Tribe regarding protected rights and resources will be accorded due consideration in this process. This Public Notice serves as notification to the Tribes within the area potentially affected by the proposed work and invites their participation in the Federal decision-making process regarding the protected Tribal right or resource. Consultation may be initiated by the affected Tribe upon written request to the District Commander during the public comment period.

PUBLIC HEARING: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, reasons for holding a public hearing.

EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impacts including cumulative impacts of the proposed activity and its intended use on the public interest. Evaluation of the probable impacts, which the proposed activity may have on the public interest, requires a careful weighing of all the factors that become relevant in each particular case. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. The outcome of the general balancing process would determine whether to authorize a proposal, and if so, the conditions under which it will be allowed to occur. The decision should reflect the national concern for both protection and utilization of important resources. All factors, which may be relevant to the proposal, must be considered including the cumulative effects thereof. Among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving 404 discharges, a permit will be denied if the discharge that would be authorized by such permit would not comply with the Environmental Protection Agency's 404(b)(1) guidelines. Subject to the preceding sentence and any other applicable guidelines or criteria (see Sections 320.2 and 320.3), a permit will be granted unless the District Commander determines that it would be contrary to the public interest.

The Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Comments on the described work, with the reference number, should reach this office no later than the expiration date of this Public Notice to become part of the record and be considered in the decision. If further information is desired concerning this notice, p lease contact Ms. Serena Sweet at (907) 753-2712, toll free from within Alaska at (800) 478-2712, or by email at serena.e.sweet@poa02.usace.army.mil.

AUTHORITY: This permit will be issued or denied under the following authorities:

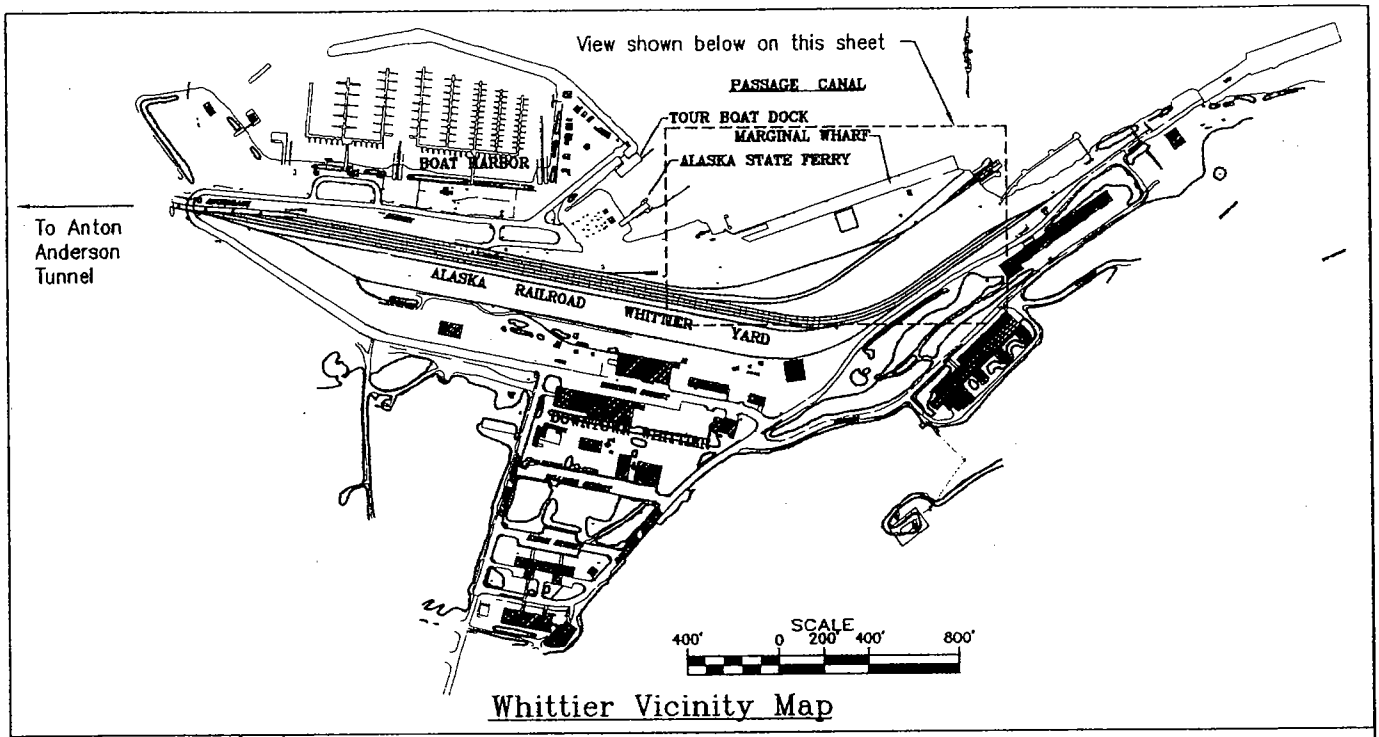
(X) Perform work in or affecting navigable waters of the United States - Section 10 Rivers and Harbors Act 1899 (33 U.S.C. 403).

(X) Discharge dredged or fill material into waters of the United States - Section 404 Clean Water Act (33 U.S.C. 1344). Therefore, our public interest review will consider the guidelines set forth under Section 404(b) of the Clean Water Act (40 CFR 230).

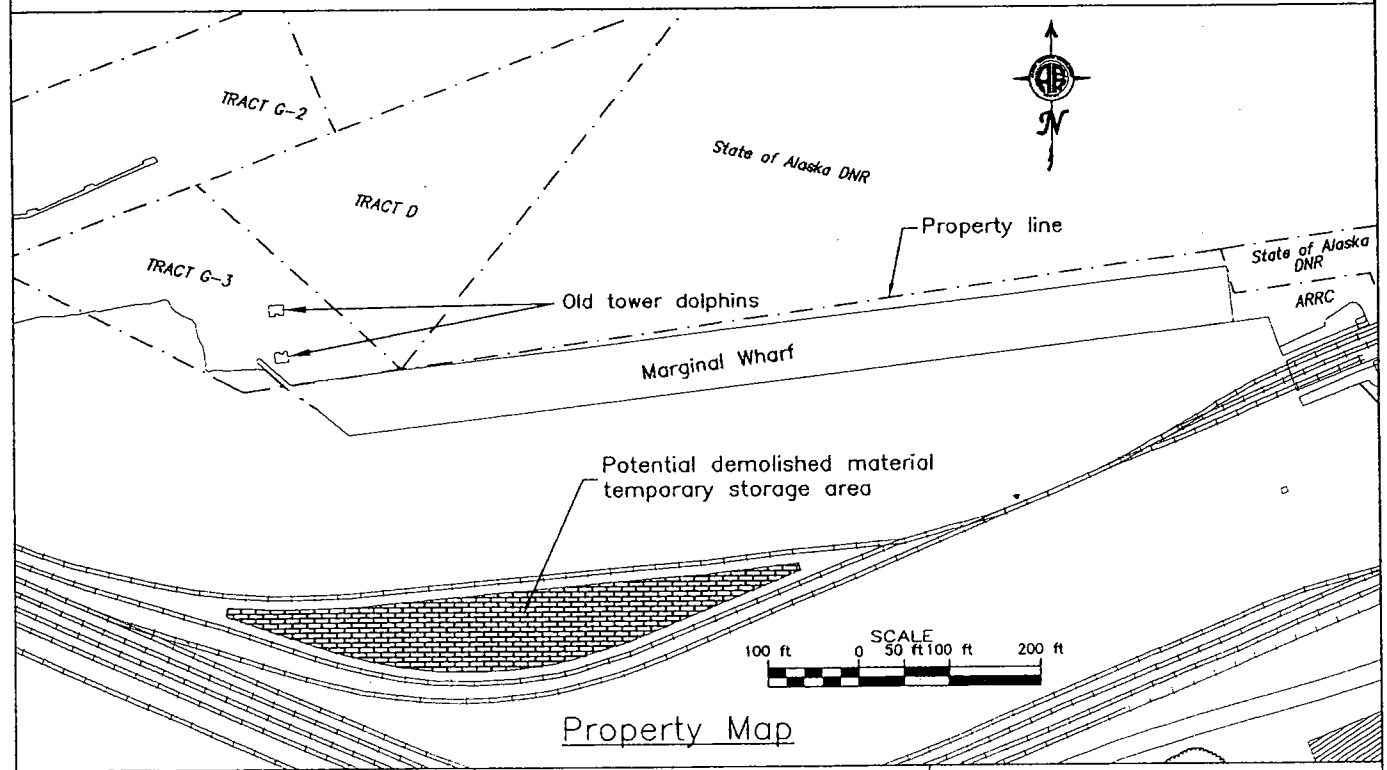
Project drawings, Notice of Application for Certification of Consistency with the Alaska Coastal Management Program, and Notice of Application for State Water Quality Certification are enclosed with this Public Notice.

District Commander
U.S. Army, Corps of Engineers

Enclosures



Whittier Vicinity Map



Property Map

PURPOSE: To demolish Marginal Wharf and construct a new dock in its place

PERMIT:

DATUM: MLLW

ADJACENT PROPERTY OWNERS:
UPLANDS: Alaska Railroad
OFFSHORE: State of Alaska

Marginal Wharf Demolition

COE File Number POA-2006-37-9

ALASKA RAILROAD CORP.
327 W. Ship Creek Avenue
P.O. Box 107500
ANCHORAGE, ALASKA 99510-7500

Location & Property Map

IN: Passage Canal
AT: Whittier
No Borough
APPLICATION BY:
Roy Thomas, Director Engr Svcs
ARRC-ENGINEERING SERVICES
Anchorage, Alaska
SHEET: 1 OF 6 DATE: 03/22/07

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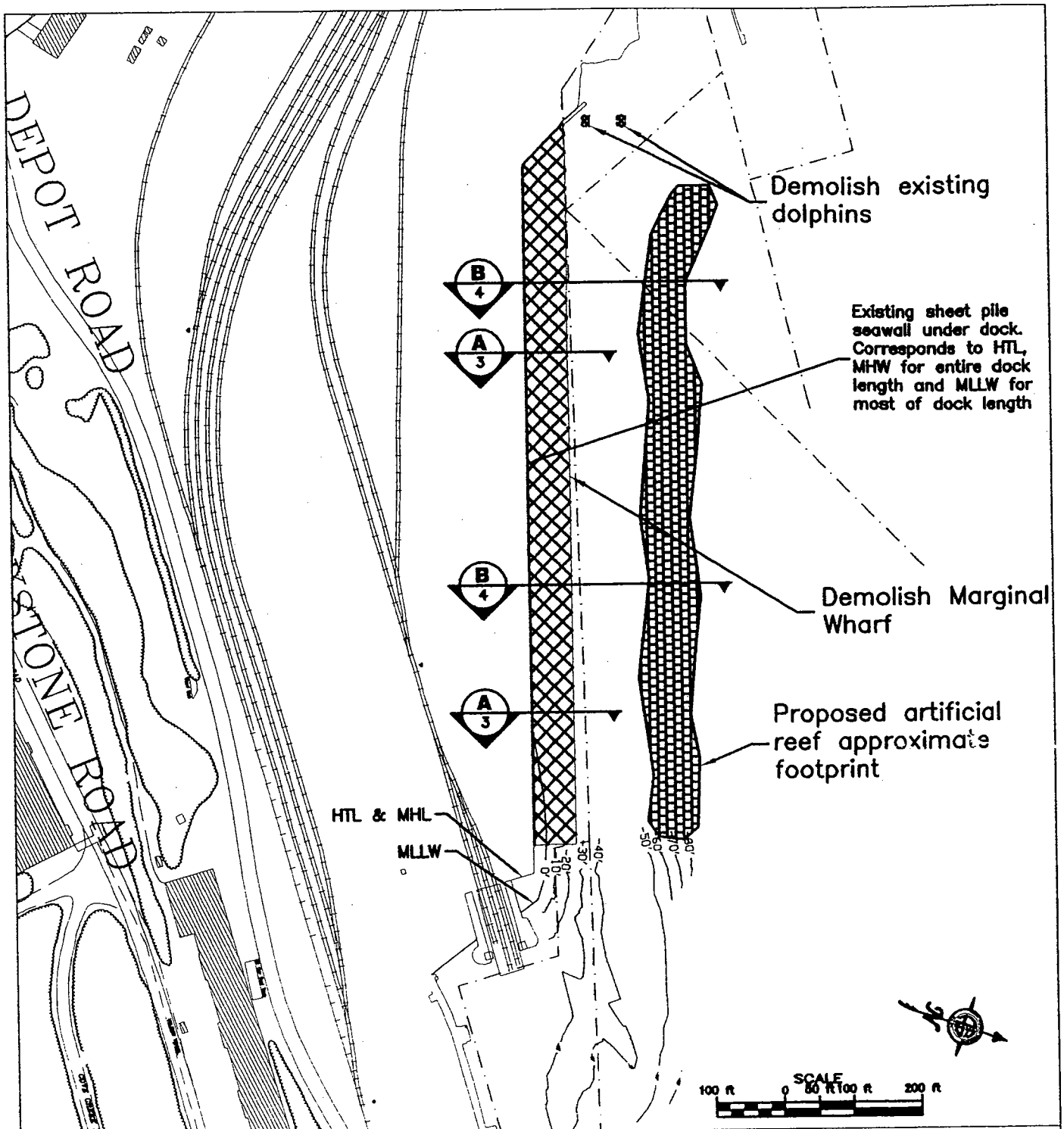

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DATUM: MLLW

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UPLANDS: Alaska Railroad
OFFSHORE: State of Alaska

Marginal Wharf Demolition

COE File Number POA-2006-37-9

ALASKA RAILROAD CORP.
327 W. Ship Creek Avenue
P.O. Box 107500
ANCHORAGE, ALASKA 99510-7500

Plan View

IN: Passage Canal
AT: Whittier
No Borough
APPLICATION BY:
Roy Thomas, Director Engr Svcs
ARRC-ENGINEERING SERVICES
Anchorage, Alaska
SHEET: 2 OF 6 DATE: 03/19/07

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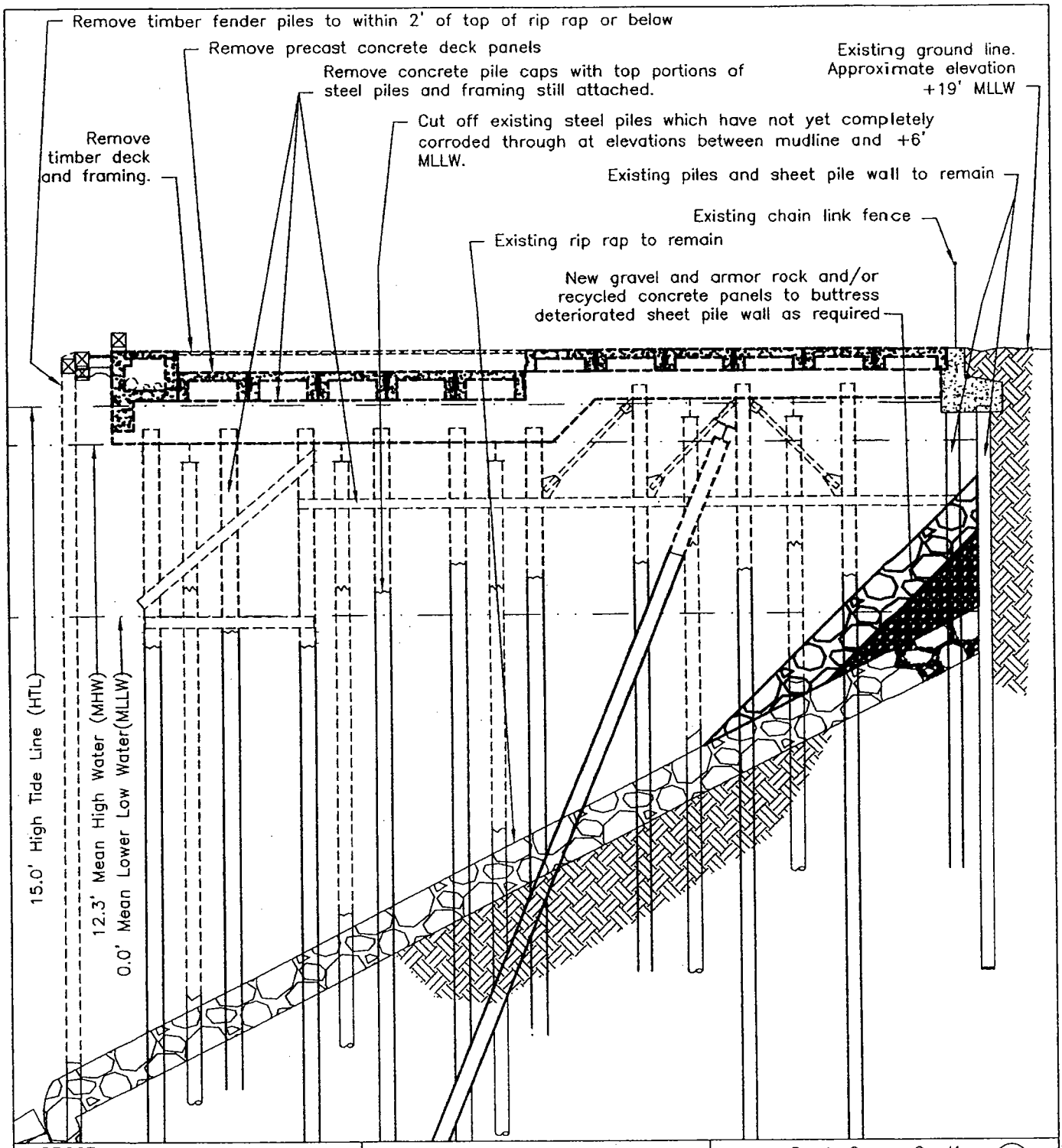

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DATUM: MLLW

ADJACENT PROPERTY OWNERS:
UPLANDS: Alaska Railroad
OFFSHORE: State of Alaska

Marginal Wharf Demolition

COE File Number POA-2006-37-9

ALASKA RAILROAD CORP.
327 W. Ship Creek Avenue
P.O. Box 107500
ANCHORAGE, ALASKA 99510-7500

Dock Cross Section (A 3 | 3)

IN: Passage Canal
AT: Whittier
No Borough
APPLICATION BY:
Roy Thomas, Director Engr Svcs
ARRC-ENGINEERING SERVICES
Anchorage, Alaska
SHEET: 3 OF 6 DATE: 03/22/07

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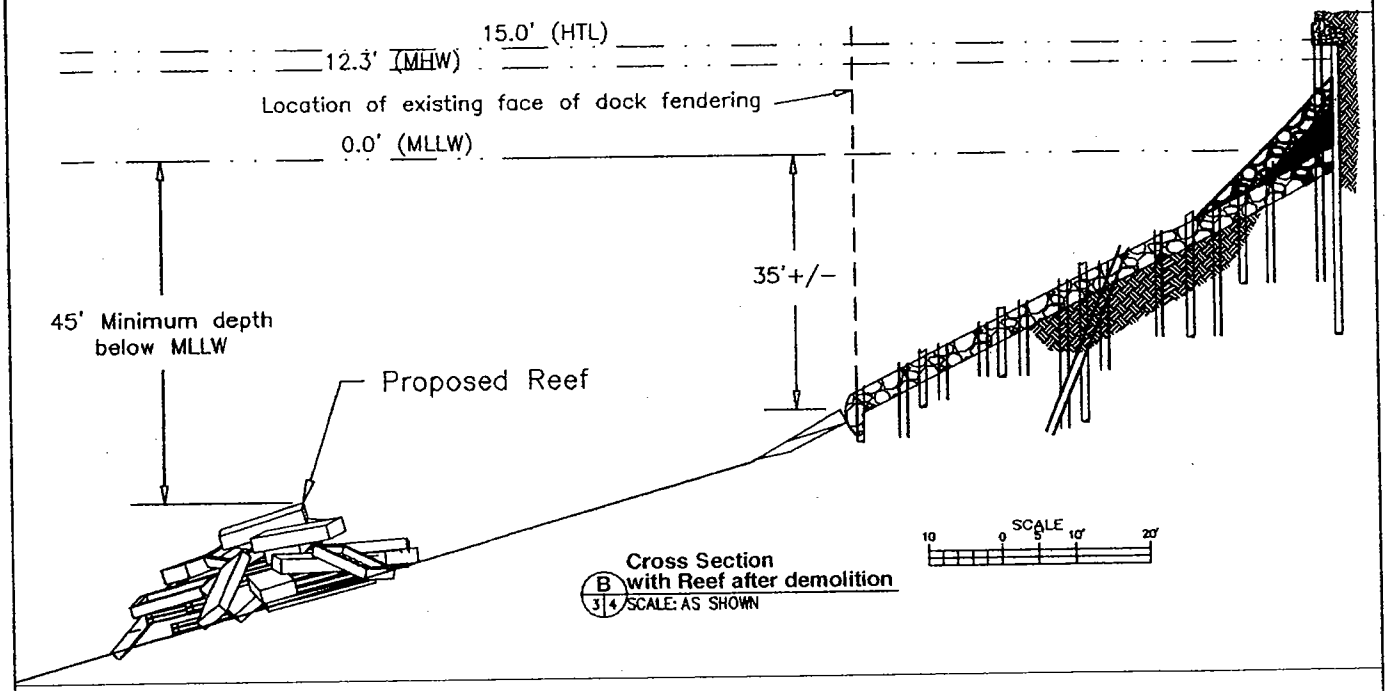
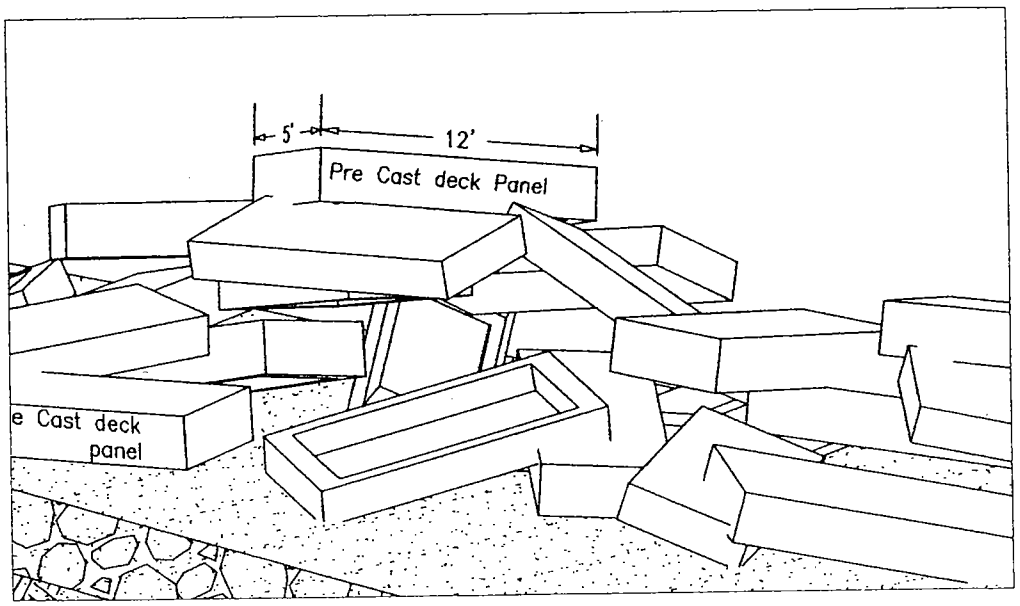




3D View of portion of reef

PURPOSE: To demolish Marginal Wharf and construct a new dock in its place

PERMIT:

DATUM: MLLW

ADJACENT PROPERTY OWNERS:
UPLANDS: Alaska Railroad
OFFSHORE: State of Alaska

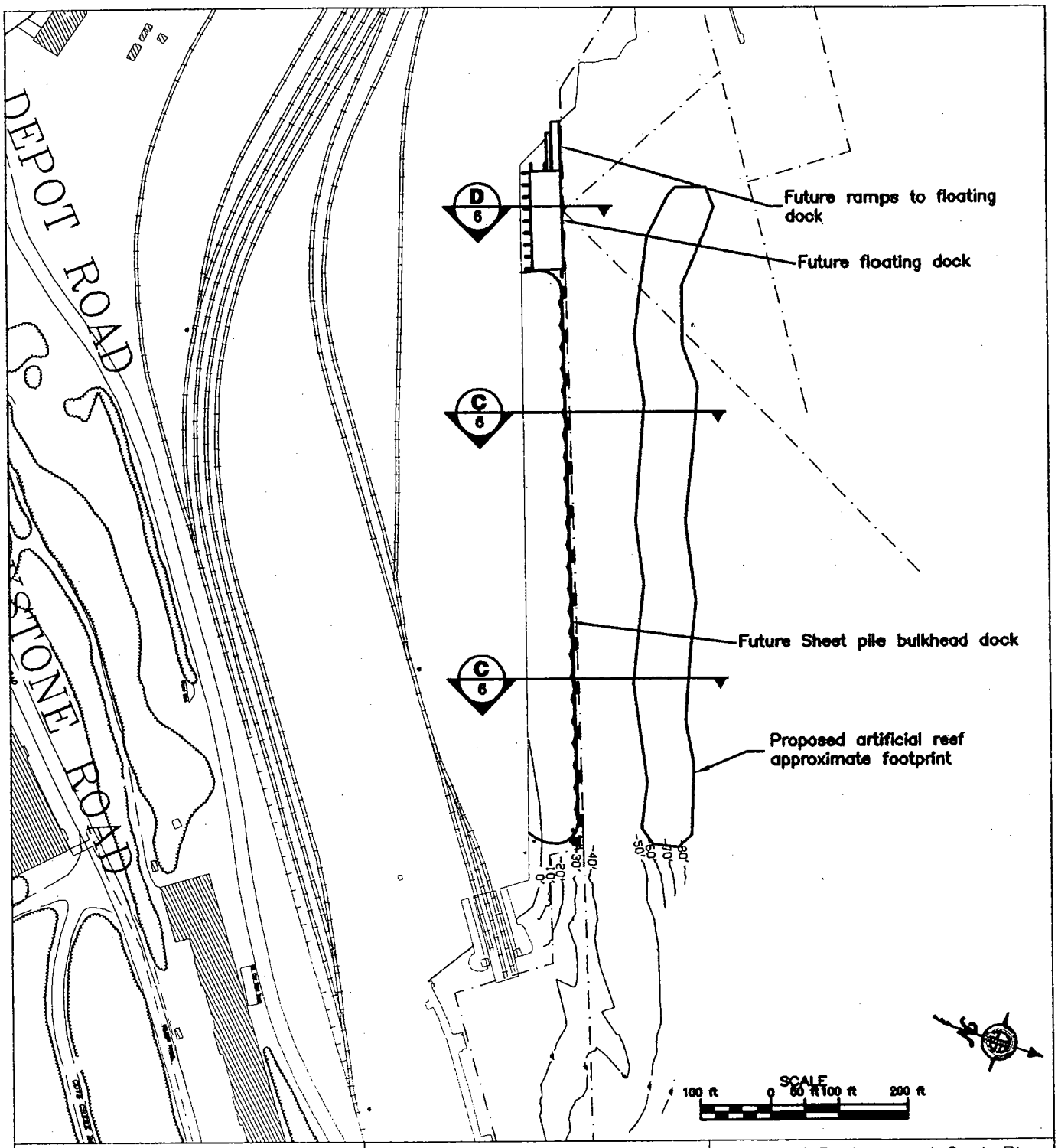
Marginal Wharf Demolition

COE File Number POA-2006-37-9

ALASKA RAILROAD CORP.
327 W. Ship Creek Avenue
P.O. Box 107500
ANCHORAGE, ALASKA 99510-7500

Reef Details

IN: Passage Canal
AT: Whittier
No Borough
APPLICATION BY:
Roy Thomas, Director Engr Svcs
ARRC-ENGINEERING SERVICES
Anchorage, Alaska
SHEET: 4 OF 6 DATE: 03/22/07



PURPOSE: To demolish Marginal Wharf and construct a new dock in its place

PERMIT:

DATUM: MLLW

ADJACENT PROPERTY OWNERS:
UPLANDS: Alaska Railroad
OFFSHORE: State of Alaska

Marginal Wharf Demolition

COE File Number POA-2006-37-9

ALASKA RAILROAD CORP.
327 W. Ship Creek Avenue
P.O. Box 107500
ANCHORAGE, ALASKA 99510-7500

Proposed Replacement Dock Plan

IN: Passage Canal
AT: Whittier
No Borough
APPLICATION BY:
Roy Thomas, Director Engr Svcs
ARRC-ENGINEERING SERVICES
Anchorage, Alaska
SHEET: 5 OF 6 DATE: 03/19/07

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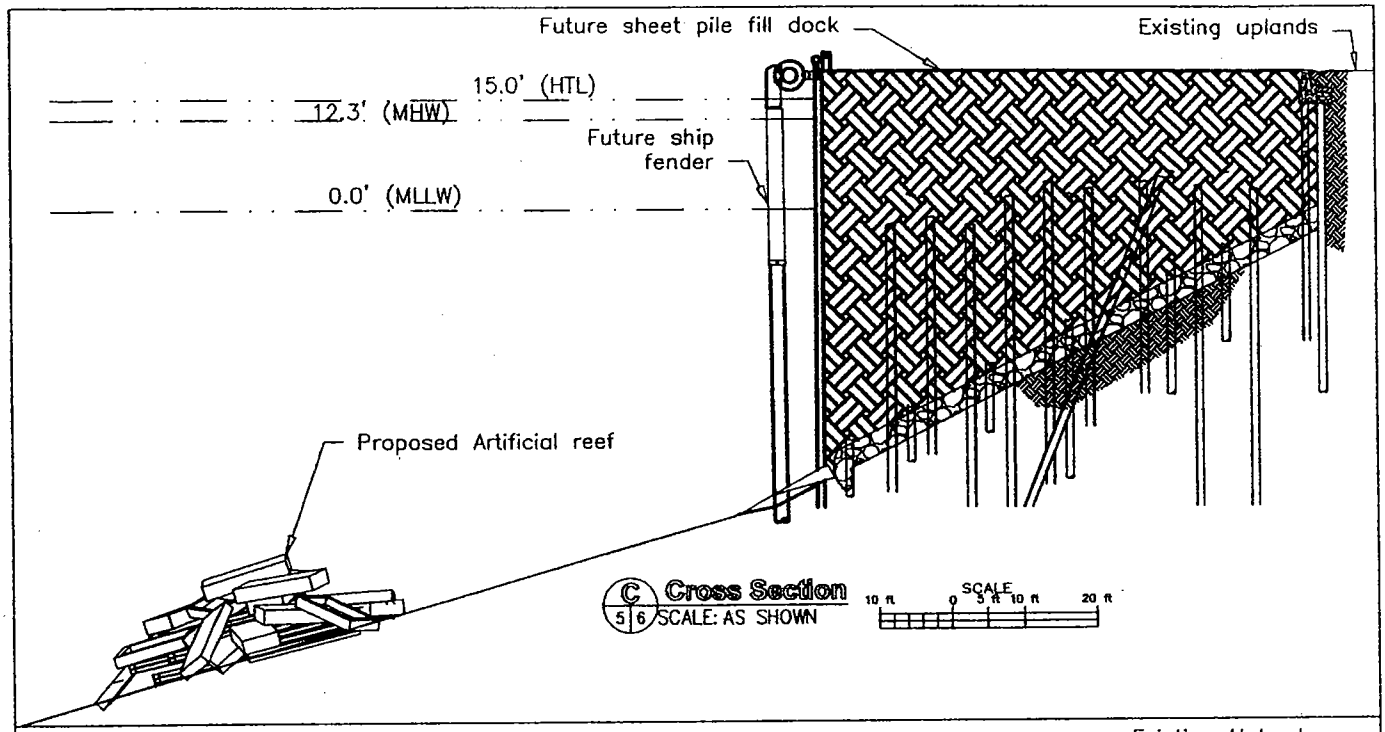

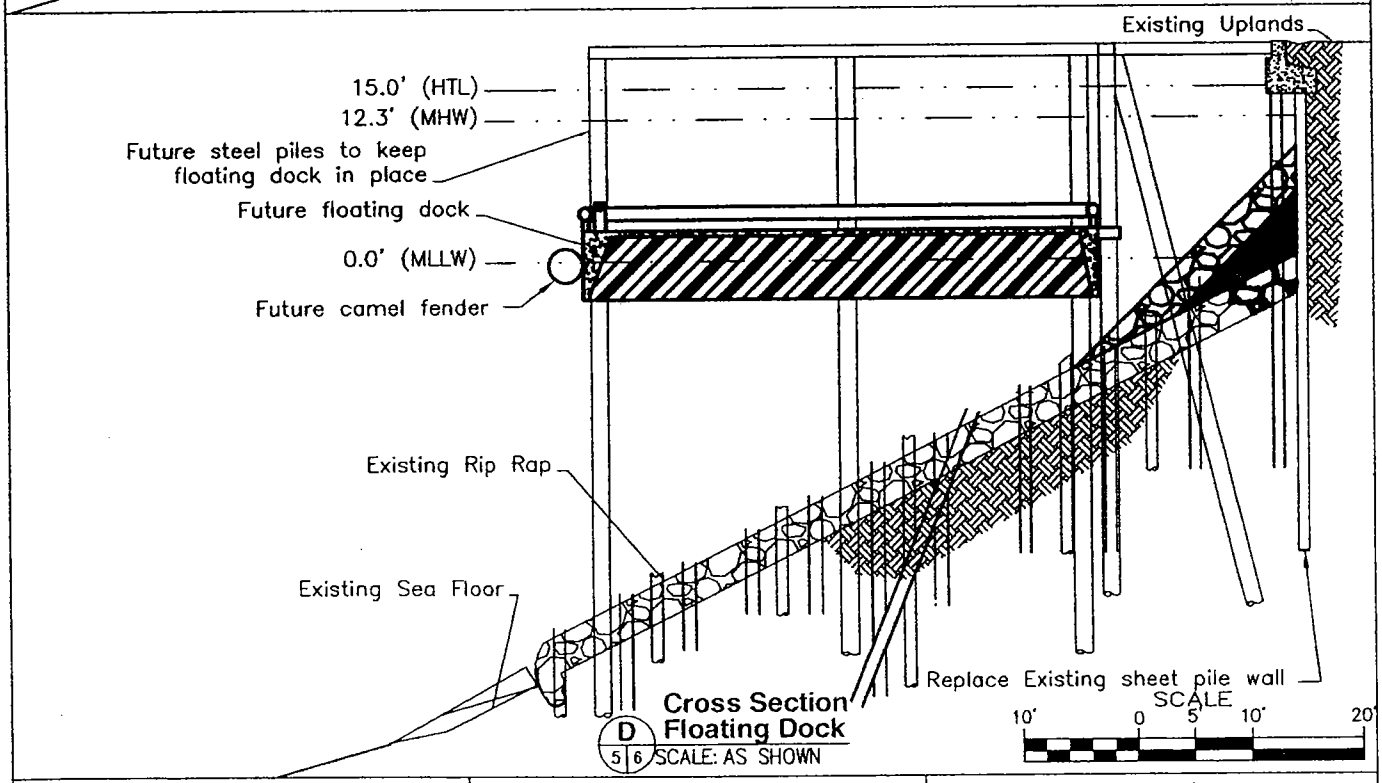

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DATUM: MLLW

ADJACENT PROPERTY OWNERS:
UPLANDS: Alaska Railroad
OFFSHORE: State of Alaska

Marginal Wharf Demolition

COE File Number POA-2006-37-9

ALASKA RAILROAD CORP.
327 W. Ship Creek Avenue
P.O. Box 107500
ANCHORAGE, ALASKA 99510-7500

Dock Cross Section

IN: Passage Canal
AT: Whittier
No Borough
APPLICATION BY:
Roy Thomas, Director Engr Svcs
ARRC-ENGINEERING SERVICES
Anchorage, Alaska
SHEET: 6 OF 6 DATE: 03/22/07

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Alaska Railroad Whittier Intermodal Facility: Marginal Wharf Demolition and Construction of a New Dock

Project Description: The Alaska Railroad Corporation (ARRC) proposes to demolish its existing 1,100 foot by 60 foot Marginal Wharf and construct a new dock as part of a multi-year work effort. Due to safety considerations, Marginal Wharf demolition would take place in Phase 1, as it is in imminent danger of collapsing, which would present a public safety hazard. Additional Phase 1 work includes demolishing two tower dolphins located at the west end of the Marginal Wharf and buttressing the existing sheet pile with gravel and armor rock, as needed. The tower dolphins were associated with the old barge slip, are badly deteriorated and are no longer used. Phase 2 includes construction of the new multi-use dock to enhance intermodal transfer of passengers between land and marine modes of transportation. When not in use for passenger operations, the eastern portion of the dock may also be used as needed for freight activities. The structure type would be a combination of fill and floating dock. When the new floating dock is constructed, the existing sheet pile wall adjacent to it may need to be replaced.

Materials generated during dock demolition include timber and rubber from the dock surface and fenders, concrete with embedded steel, and steel (piles). Existing timber (on the dock surface) would be removed prior to dock demolition. Steel piles would be removed as deemed necessary to enhance safety and as funding permits. Steel piles, timber, and rubber would be recycled or disposed in accordance with applicable regulations. Since construction of the new fill dock could result in impacts to Essential Fish Habitat (EFH), consultation has been conducted with the National Marine Fisheries Service (NMFS) and other regulatory and resource agency representatives regarding the use of concrete and embedded steel from the Marginal Wharf as an artificial reef to mitigate this impact. Refer to the section on mitigation below.

Phase 1 work would occur within ARRC's existing reserve boundary, with the exception of artificial reef construction and removal of the tower dolphins which would occur in State of Alaska waters/submerged lands. Phase 2 work would occur on ARRC property (within its existing reserve boundary).

Schedule: Based on consultation with NMFS, in-water work for dock demolition would be conducted from October 1, 2007 through March 31, 2008 or during lower tide levels when the site is de-watered. Construction of the new dock is not yet scheduled, and its construction schedule is dependant on securing funding. However, in water activities for construction of the new dock also would occur from October 1 through March 31 or during lower tide levels when the site is de-watered unless otherwise authorized.

Background Information: The Marginal Wharf was constructed in 1958 by the U.S. military. Ownership transferred to the Alaska Railroad in 1964, and it was used for 44 years. It was condemned and closed in 2002 due to severe corrosion of the steel piles. The dock was constructed to serve as a general purpose dock and mainly served freight barges, and more recently fishing boats. On June 14, 2006, the USACE permit for construction of Marginal Wharf was transferred from the Department of the Army to ARRC (POA 2006-37-9, POA 1954-0038-1).

The proposed project is part of ARRC's proposed Whittier Intermodal Facility project. The purpose of that project is to improve ARRC's Whittier intermodal passenger facilities by developing infrastructure and services that support growth in the movement of passengers and freight, promote passenger safety and convenience, and meet ARRC.s operational goals and objectives. In additional to replacing the Marginal Wharf, the Whittier Intermodal Facility project also includes various upland improvements (passenger terminal area, passenger parking, circulation and access improvements, associated rail yard, track, and utility improvements). Additional in-water improvements associated with the Whittier Intermodal Facility project may include construction of an engineered embankment west of the Marginal Wharf.

Permits/Related Activities: The proposed project requires a USACE permit and authorization from the ADNR – OPMP. Use of concrete from the Marginal Wharf as an artificial reef and removal of the tower dolphins would also require a permit from ADNR Division of Mining, Land, and Water.

ARRC will be submitting an application to modify P-1969-0024, Passage Canal 16 for its existing Barge Slip to install a mooring dolphin. The mooring dolphin is needed for safe docking and mooring of barges at the Barge Slip. That function is currently provided by features on the Marginal Wharf, which will be gone when the wharf is demolished. The critical safety function those features provide in maneuvering and holding barges in place must be maintained. Other needed improvements to the Barge Slip may also be included in that application.

Environmental Considerations:

The waters of Passage Canal near Whittier are designated as EFH for all five species of salmon. NMFS has indicated that construction of a new fill dock would impact EFH, and that ARRC should consider alternatives that avoid, minimize and mitigate impact to EFH. Conservation/mitigation measures that would be implemented as part of the project are as follows:

- An in-water work window of October 1 through March 31 would be required.
- Construction of an artificial reef would enhance and/or replace fish habitat lost from construction of a new dock.
- Additional conservation/mitigation measures may be identified during permitting.

Alternatives

ARRC has considered several alternatives to the proposed action: 1) the no action alternative, 2) rehabilitation of dock piles, and 3) demolition of Marginal Wharf, but without construction of a new dock. These alternatives are described below.

1. No Action Alternative: The no action alternative (leave Marginal Wharf in place) is not advisable due to safety considerations, as the dock is in imminent danger of collapse. This alternative also does not meet the purpose and need for the project.
2. Rehabilitation of Dock Piles: This alternative involves leaving the concrete wharf in place, and replacing the corroded piles to correct the structural problems. The underside of the dock is submerged at higher tidal stages and can not be economically rehabilitated. It is not technically, safely or economically feasible to rehabilitate the dock by replacing the corroded piles.
3. Dock Removal Without Construction of a New Dock: Under this alternative, the existing dock would be removed, but a new dock would not be constructed in its place. This alternative does not meet ARRCs objective which is to replace the existing condemned dock in order to enhance intermodal transfer of passengers between land and marine modes of transportation.

Several alternative structure types for the new dock have been considered including:

- pile-supported dock
- sheet pile/fill dock
- floating dock
- combination floating/fill dock

Table 1 summarizes the advantages and disadvantages of the various structure types. ARRC prefers a structure design that allows flexibility for multiple uses. For example, a floating dock would best serve day boats due to tidal fluctuations and is the cheapest on a per foot basis; however, it would not allow use of the dock for freight operations. For cruise ships and freight, which require a static elevation, and for a dock like this with only one working face, a sheet/pile fill dock works best. For the purpose of this permit

application, the proposed structure type is a combination of floating (approximately 200 feet) and sheet pile/fill (approximately 900 feet) to obtain a worst-case estimate of EFH impacts. Closer to the time of construction of the new dock, if a design change is necessary to accommodate customer needs and anticipated use, ARRC will submit an application for a permit modification. If an alternative design is proposed at a later date, EFH impacts will be reduced, not increased.

Mitigation:

Artificial Reef

ARRC proposes to construct an artificial reef approximately 60 feet from the dock to enhance and/or replace fish habitat and offset future EFH impacts associated with construction of a replacement fill dock. Artificial reefs have been used extensively in several areas of the U.S. Several artificial reefs have also been constructed in Alaskan waters, including one in Whittier. They have been shown to mimic local natural ecosystems and last for decades providing important habitat and feeding stations for fish. By using the concrete from the Marginal Wharf to construct an artificial reef, the material continues to serve a productive use.

The artificial reef would be constructed with approximately 3,500 cubic yards of concrete, would be approximately 800 to 1,000 feet long, and would run parallel to the dock face. ARRC's construction contractor would be required to monitor during and following reef construction to ensure the reef is constructed as designed. Only clean concrete and clean unpainted unrecycleable steel would be used for reef construction. No portion of the reef would be greater in elevation than -45' MLLW. Material would be placed in such a manner that the reef structure is stable and the maximum practical interstitial space is created. Material would be lowered until it is resting on the sea floor before it is released from crane rigging, not dropped. Pile caps would be placed on the sea floor and on other pile caps. Decking sections would be placed on top of the pile caps and/or other decking sections. Decking sections that partially rest on the sea floor would be inclined at an angle no less than 10 degrees from the plane of the underlying sea floor, with the average inclination of all the decking not less than 15 degrees, nor greater than 75 degrees. The contractor would periodically monitor material placement both during and after construction is completed to confirm compliance with the design specifications.

The estimated construction cost, using the construction technique requested by agency representatives and with construction monitoring, is $95,000. In addition, ARRC would provide $30,000 to NMFS for long term monitoring and/or research of the artificial reef. If construction of only a portion of the reef is authorized, ARRC's contribution to NMFS for monitoring/research would be reduced accordingly.

During project development, ARRC considered five alternative artificial reef locations: Head of the Bay (in Whittier), Smitty's Cove (in Whittier), Shotgun Cove (east of Whittier), Two Moon Bay near Valdez; and in front of the Marginal Wharf. ARRC prepared an Artificial Reef Proposal that provides more detail on the existing conditions, proposed artificial reef design, and alternatives considered. The location in front of the Marginal Wharf was chosen as it would enhance /replace fish habitat directly adjacent to the location of the fish habitat that would be lost and would minimize costs associated with transportation, handling, and deployment of the materials. It would also provide convenient access for post-construction monitoring and research opportunities. The only disadvantage to this location is that it would not provide recreational opportunities for divers due to its proximity to ARRC freight barge activities, the state ferry, and other commercial boats. However, the site has the potential to provide sport fishing opportunities that could be compatible with boat operations at the new dock.

Alternative Mitigation

ARRC is aware that its proposed Artificial Reef mitigation may not be approved due to the mistaken perception that it is ocean disposal rather than mitigation. One resource agency has also indicated that

mitigation is not needed in Whittier. If the artificial reef is not approved as mitigation for construction of a new floating/fill dock, ARRC would place the material within its right–of-way in Bear Valley and contribute $15,000 as mitigation for future EFH impacts. This money would be provided either to the City of Whittier (for use towards a proposed salmon enhancement lagoon project) or to NMFS (for ongoing monitoring of the existing artificial reef in Smitty's Cove or for another project of its choice). We believe this amount provides appropriate mitigation, since the EFH beneath Marginal Wharf that would be affected by future construction of a new dock has been previously disturbed and compromised. ARRC is not proposing the artificial reef to minimize project costs; our intent with the artificial reef proposal has always been to enhance and/or replace fish habitat to offset future EFH impacts associated with replacing Marginal Wharf.

Table 1. Dock Structure Design Alternatives

	Dock Description	Appr. Cost (millions)	Area of habitat lost (ft^2)[b]	Advantages	Disadvantages
Alternative A[a]	Sheet pile/fill dock with appr. 200 feet of floating dock	$14-17	54,000	• Low maintenance cost. • Sheet pile/floating dock combination allows for berthing of large and smaller vessels. • Floating dock could be constructed first with construction of the fill dock as funding becomes available.	• Floating portion of dock is more susceptible to damage by rough seas and is not useful for cargo. • Reduces the docks utility for vessels greater than 750' long
Alternative B	All sheet pile/fill	$15-20	66,000	• Lowest maintenance cost. • Can be used for passenger and freight handling. • Most versatile dock type for making improvements such as utilities, lighting, and buildings. • Less vulnerable to corrosion than pile supported docks.	• More difficult than a floating dock for smaller cruise vessels to dock at. • Impacts the largest amount of EFH.
Alternative C	All floating dock	$9-12	none	• Only temporary impacts to EFH during construction. • Lowest cost dock design.	• Dredging would be required to obtain adequate depth. • More easily damaged by rough seas than other dock types. • Limits flexibility for long-term use of dock. Would not support most freight handling due to low load capacity. • Highest maintenance cost dock
Alternative D	Pile supported dock	$20-22	minimal	• Minimal impacts to EFH. • Would support both passenger handling and freight operations.	• Highest cost dock. • Higher long term maintenance costs than sheet pile dock.
Alternative E	Sheet pile cells with floating dock in between	$13-16	36,000	• Sheet pile cells would provide some protection to the floating sections. • Less expensive than full sheet pile dock.	• Would require dredging to provide the maximum square feet of usable surface area. • Would be less conducive to freight handling.

a. All docks would be approximately 1,100 feet long and 60 feet wide.
b. Habitat under the existing Marginal Wharf currently consists of armor rock placed to protect the dock.

WHITTIER ARTIFICIAL REEF PROPOSAL

Alaska Railroad Corporation

Photo Source: Guidelines for Marine Artificial Reef Materials

April 2007

Table of Contents

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Purpose of Document

The Alaska Railroad Corporation (ARRC) proposes to demolish its Marginal Wharf in Whittier, Alaska and construct a new dock (Figure 1). In January 2007, ARRC initiated consultation with representatives of various regulatory agencies regarding the possibility of constructing an artificial reef with the concrete generated during Marginal Wharf demolition to mitigate for the loss of Essential Fish Habitat (EFH) when the new dock is constructed. This document further describes the artificial reef proposal, its purpose, alternatives, and the advantages and disadvantages associated with construction of the artificial reef. It is intended to be used by regulatory agencies in evaluating ARRC's permit applications for the dock replacement project, which include construction of an artificial reef.

1.2 Background Information on Marginal Wharf

The Marginal Wharf was constructed by the U.S. Army Corps of Engineers (USACE) in 1958. It consists of a dock on a steel pile foundation and a concrete deck approximately 60 feet wide and 1,100 feet long. The concrete pile caps of the wharf have been periodically submerged in seawater because of land subsidence from the 1964 earthquake. Corrosion protection of the steel piles was discontinuous over the years, and as a result, the steel piles and concrete pile caps have been gradually deteriorating. The dock is structurally deficient and was permanently closed in 2002.

ARRC proposes to demolish the Marginal Wharf and construct a new dock as part of a multi-year work effort. Due to safety considerations, Marginal Wharf demolition would be Phase 1, as it is in imminent danger of collapsing, which would present a public safety hazard. Phase 2 includes construction of the new multi-use dock to enhance intermodal transfer of passengers between land and marine modes of transportation. When not in use for passenger operations, the eastern portion of the dock may also be used as needed for freight activities. The structure type would be a combination of fill, platform, and/or floating dock (Figure 2).

The proposed project is part of ARRC's proposed Whittier Intermodal Facility project. The purpose of that project is to improve ARRC's Whittier intermodal passenger facilities by developing infrastructure and services that support growth in the movement of passengers and freight, promote passenger safety and convenience, and meet ARRC's operational goals and objectives. In additional to replacing the Marginal Wharf, the Whittier Intermodal Facility project also includes various upland improvements (passenger terminal area, passenger parking, circulation and access improvements, associated rail yard, track, and utility improvements).

The National Marine Fisheries Service (NMFS) has indicated that construction of the new fill dock would impact EFH. Therefore, consultation has been conducted with NMFS and other regulatory and resource agency representatives regarding the use of concrete and embedded steel from the Marginal Wharf as an artificial reef to mitigate this impact.

1.3 Background Information on Artificial Reefs

An artificial reef is a structure constructed or placed in waters for the purpose of enhancing fishery resources and/or fishing opportunities. The National Fishing Enhancement Act of 1984 brought attention to artificial reefs by calling for, among other things, development of a long

term National Artificial Reef Plan. The National Marine Fisheries Service (NMFS) led development of the National Plan, which was completed and adopted in 1985. The National Plan discusses the following general criteria for materials that are to be used in the development of artificial reefs.

- Function - the reef needs to attract and hold small organisms and larger species (i.e. target fish species).
- Compatibility - compatible in a marine environment
- Durability - resistant to chemical and physical forces
- Stability - material needs to remain in its original configuration

Concrete meets these criteria and has a demonstrated high success rate as artificial reef material in both marine and estuarine environments. Artificial reefs created using concrete have been constructed in a number of states. Some of these applications are summarized in Table 1.

As indicated in the *Guidelines for Marine Artificial Reef Materials* (Gulf and Atlantic States Marine Fisheries Commission 2004), artificial reefs constitute habitat for fish and other aquatic organisms. Regardless of the reason for developing particular artificial reefs (create marine life habitat, enhance fishing success, mitigate for loss of natural reefs, or aquaculture), the end result is the creation of habitat for fish species and other organisms that utilize the new habitat for a variety of reasons (e.g., shelter, feeding, and spawning).

> "Indeed, the habitat aspects of artificial reefs are important enough that several Fishery Management Councils have determined that artificial reefs can be designated "essential fish habitat" (EFH) under the definition provided by the Sustainable Fisheries Act amendments to the Magnuson-Stevens Fishery Conservation and Management Act. That definition reads "Essential fish habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." (Gulf and Atlantic States Marine Fisheries Commission 2004)

Further support for use of construction demolition materials for marine habitat creation is the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which President Bush signed on August 10, 2005 (Public Law 109-59). SAFETEA-LU authorizes the Federal surface transportation programs for highways, highway safety, and transit for a 5-year period (2005-2009). SAFETEA-LU Section 1805 directs a state to first make debris from the demolition of bridges and overpasses available for beneficial use by a federal, State, or local government, unless such a use obstructs navigation. Beneficial use is defined as shore erosion control or stabilization, ecosystem restoration, and marine habitat creation.

1.3.1 Artificial Reefs in Alaska

Several artificial reefs have been constructed in Alaska, one in Whittier and two in Auke Bay near Juneau. The artificial reef in Whittier was constructed in Smitty'Cove in 2006 to mitigate for habitat lost when a container facility was constructed. The reef was constructed from approximately 100 hollow concrete balls and pyramids. The reefs are being monitored for colonization and appear to be working; however, there is limited data available as to the effectiveness of the reefs to create habitat since they were installed less than a year ago.

The two artificial reefs in Auke Bay were constructed from cement boats that were sunk in 2003 and 2004 in approximately 50 and 70 feet of water. According to divers, the sunken boats have attracted many species including king crab, tom cod, needle fish, Dungeness crab, flounder, snails, hermit crabs, sea lions, porpoise and jelly fish on or around the boat and are a popular attraction for divers. The artificial reefs constructed from the boats have been so popular with divers that local groups have plans to construct additional reefs from other materials (Orr, 2004).

1.4 Overview of Proposed Artificial Reef Project and its Purpose

The purpose of the proposed artificial reef is to enhance and/or replace fish habitat to offset future EFH impacts associated with construction of a new dock to replace the Marginal Wharf. The target species likely to be attracted to the reef include greenling, lingcod, rockfish and invertebrates such as starfish, shrimp, crab, octopus, and anemones.

The proposed artificial reef would be constructed with concrete and embedded steel generated during demolition of the Marginal Wharf. Concrete is known to be a suitable material for construction of artificial reefs, as it meets the four key criteria identified for artificial reef construction (function, compatibility, stability, and durability). Additional information is provided in Section 3.1, Design Criteria.

Based on input from regulatory agency personnel during the January 2007 meeting, the most suitable location for the artificial reef, should it be approved/permitted, is parallel to and approximately 60 feet from the existing dock (Figure 3). Section 4 describes the various alternative locations considered for the artificial reef, and well as other options considered for reusing or disposing of the materials generated during dock demolition.

An additional benefit is to provide an opportunity for an interagency cooperative effort, including the potential for research into the effectiveness of an artificial reef in Whittier. ARRC would donate available suitable reef materials, the cost of equipment and labor to construct the reef, and agreed upon financial assistance for long-term monitoring. ARRC anticipates resource agencies would be responsible for the monitoring effort, which would be funded in part by ARRC.

1.5 Limitations

This document is limited to the artificial reef portion of ARRC's proposed project. It does not address use of materials other than concrete with embedded steel for the artificial reef, as this is the primary material that will be generated during Marginal Wharf demolition. It also does not address handling, recycling, or disposal of other materials that will be generated during demolition (e.g., steel piles, timber, and rubber), as these materials would not be used to construct the artificial reef. These materials would be recycled or disposed in an upland location in accordance with applicable requirements.

2.0 EXISTING CONDITIONS

2.1 Existing EFH Beneath Marginal Wharf

As previously indicated, the Marginal Wharf was constructed in 1958. The substrate below the wharf, which was affected during dock construction, consists of steel piles and riprap (armor rock), placed in approximately 1958. Since that time, the armor rock has been colonized with anemones, sea stars and other invertebrates. The EFH beneath the Marginal Wharf that would be

affected by construction of a new dock (maximum of approximately 1.5 acres) has been previously disturbed and compromised. Additionally, shade created by the dock limits the distribution of plants, invertebrates and fishes as compared to unshaded, vegetated habitats. Light is the most important factor affecting aquatic plants. Reduced light affects the suitability for aquatic plants and also limits the ability of fishes, especially juveniles and larvae to perform essential activities such as spatial orientation, prey capture, schooling, predator avoidance, and migration (NMFS, 2005). ARRC collected samples of the seabed near the face of the Marginal wharf and found the area to consist of organic material and very fine particles. This is in contrast to samples collected at ARRC's barge slip (east of the Marginal Wharf) and at the east side of the Marginal Wharf, which were sandy gravel with negligible organic content.

2.2 Existing Conditions at Proposed Artificial Reef Area

The following sections describe the biological resources, bottom geology, hydrology, and water quality in the vicinity of the proposed artificial reef area, to the extent possible.

2.2.1 Biological Resources

Passage Canal supports all species of Pacific Salmon (*Onchorynchus* spp), as well as sculpin (Cottidae), sablefish (*Anoplopoma fimbria*), flathead sole (*Hippoglossoides elassodon*), rock sole (*Lepidopsetta bilineatus*) yellowfin sole (*Limanda aspera*), Pacific cod (*Gadus macrocephalus*), walleye Pollock (*Theragra calcogramma*), greenling (*Hexagrammos* sp.), rockfish (*Sebastes* sp.), lingcod (*Ophiodon elong-atus*), and arrowtooth flounder (*Atheresthes stomias*). Anadromous fish streams in Passage Canal support runs of chum salmon (*O. gorbuscha*) and pink salmon (*O. keta*); these species are likely to occupy the proposed project site at various times of the year for feeding and migration. Also, the Alaska Department of Fish and Game have released coho salmon (*O. kisutch*) smolts into Whittier Creek and Cove Creek for a sport fishery. The most significant use of the Passage Canal area by EFH species is during the spring salmonid outmigration. Marine mammals that may be present in Passage Canal include: harbor seals (*Phoca vitulina*), Steller sea lions (*Eumetopias jubatus*), harbor porpoise (*Phocoena phocoena*), and several species of whales, although these species are unlike to be present close to shore (National Oceanic and Atmospheric Administration, 2002).

The proposed artificial reef site is located within the inner shelf (1 to 165 feet in depth) with a substrate consisting of a relatively shallow, gently sloping bottom of non-vegetated sand and gravel. Based on a conversation with a local diver familiar with the area in front of the Marginal Wharf, the area is barren (Vandergriff, pers. comm).

2.2.2 Bottom Geology and Stability

Based on observations made of the sea floor on the west and east sides of the dock, the bottom geology of the area proposed for the artificial reef is assumed to be consolidated sandy gravel with cobbles. Due to difficult weather conditions, ARRC has not been able to collect any samples of the sea floor at the location of the proposed artificial reef.

2.2.3 Hydrology

The water depth at the proposed reef location is -60 feet MLLW. The reef would be located in sufficient water depth to not pose a navigational hazard to potential users of the new dock. This depth would also prevent or minimize the potential for wave action to cause scour or siltation of the reef from re-suspended sediment, or to destabilize the reef.

2.2.4 Water Quality

No site-specific information on water quality is available. The Alaska Ocean Observing System (AOOS) recorded salinity and temperature on March 24, 2006 at a site approximately 1.5 miles east north east of the proposed artificial reef site (60.7925° north, 148.64° west). Temperature was recorded as 4.3 °C and salinity was 30.955 practical salinity units (psu). Turbidity in the Whittier area fluctuates with wave action; however it is lower than many shallow marine areas, which attracts divers to the area. The Alaska Department of Environmental Conservation, as part of the Alaska Monitoring and Assessment Program, conducted water sampling at 55 sites in southcentral Alaska. The closest site to Whittier was located in Blackstone Bay (Saupe, Gendron, and Dasher, 2005). Generalize data collected from the Blackstone Bay site was summarized in the report; however specific results were not included. The City of Whittier sewage outfall is located approximately 500 feet northwest of the west end of the Marginal Wharf.

2.2.5 Light

Placement of the reef to allow for adequate light transmission is important to ensuring the productivity of the reef. The reef would be located in 50 to 70 feet of water which is within the euphotic zone which generally extends to a depth of 330 feet. The euphotic zone accounts for 70 percent of the entire amount of photosynthesis in the world (Water Encyclopedia, 2007). In addition to water depth, light penetration into the water is affected by turbidity and turbulence (waves). The turbidity of water near Whittier is generally fairly low compared to other near shore areas in Prince William Sound that have a higher sediment load. The low turbidity of the water near Whittier is what helps make the area a destination for divers. Two artificial reefs placed in 50 to 70 feet of water near Juneau, Alaska have proven to be very effective at attracting marine organisms.

2.2.6 Navigation

Current use of the waters in the vicinity of Marginal Wharf is negligible, as the dock has been closed for many years. Potential future planned uses are for a multi-modal dock. Anticipated future vessels utilizing the replacement dock are large and small cruise ships and day boats, container barges and ships on and off loading freight, pipe ships, military vessel port of call, etc. Navigational depth requirements below -45 MLLW are not anticipated.

2.2.7 Commercial and Recreational Fishing Patterns in the Vicinity

Many commercial fishing vessels, personal boats for recreational fishing, and fishing charter boats are based in Whittier. No commercial fishing occurs in the waters in front of the City; most boats/fishermen head out of Whittier and into Passage Canal. However, sport fishing for salmon and shrimp occurs in the general area.

3.0 PROPOSED ARTIFICIAL REEF

The artificial reef would be designed and constructed to allow the best chance of achieving the intended purpose. In addition, monitoring is important to confirm that the anticipated benefits are derived from the artificial reef. The following sections identify the pertinent design criteria, describe the proposed reef, and discuss monitoring.

3.1 Design Criteria

ARRC has identified the following design criteria for the artificial reef.

Practicality/materials. The selected material for construction of the reef must be compatible with the marine environment, highly durable, stable, and readily available. Concrete provides excellent surfaces and habitat for the settlement and growth of encrusting or fouling organisms, which in turn provide forage and refuge for other invertebrates and fish (Gulf and Atlantic States Marine Fisheries Commission, 2004). A large quantity of concrete, known to be suitable for artificial reef construction, will become available nearby during demolition of the Marginal Wharf. Therefore, the only material under consideration for the reef is the concrete with embedded steel that would be generated during wharf demolition. The concrete is a mix of smooth and rough surfaces.

View of concrete proposed for use in the artificial reef.

Location. It is important that the location selected for the reef allow for handling, transportation, preparation, and placement of the reef within safe and relatively low-risk, cost-effective limits. An easily accessible nearby location would also be desirable to facilitate monitoring and research. Section 4.0 describes the various alternative locations considered for the artificial reef.

Depth. Water depth would affect the composition of species at the reef, including invertebrates, plant life, and fish assemblages. In addition, the highest point of the reef should be at an elevation of -45' MLLW or lower so that it would not pose a navigational hazard to potential users of the new dock and to prevent potential scour, siltation, or destabilization due to wave action during storm events. Placement of the reef at this depth would also allow for adequate light penetration, which is important to ensuring the productivity of the reef.

Configuration. The overall configuration of the materials on the reef is important in determining how the reef would be used. The reef would be configured to provide substrate for epibenthic colonization, varied interstitial spaces providing refuge for mobile species, and habitat for reef fish. A mounded configuration is preferred over a spread out configuration, as it would minimize the extent of affected bottom substrate and maximize the surface area and interstitial spaces.

3.2 Description

The artificial reef would be placed approximately 60 feet from and parallel to the existing Marginal Wharf. The proposed artificial reef would be a complex, multi-planar structure consisting mainly of about 1,000 concrete panels approximately 12 feet by 5 feet by 2 feet interspersed with concrete and pile caps with some embedded steel stacked in a near random pattern designed to maximize interstitial spaces. The total volume of solids is approximately 3,500 cubic yards, with a total reef footprint anticipated to be between one and two acres and a surface area of about six acres. The reef would be approximately 800 to 1,000 feet long by 60 feet wide by 10 to 15 feet high, as depicted on Figure 3.

The total surface area of the reef would be about 275,000 square feet. An anticipated 10,000 cubic yards of interstitial spaces would be available upon reef completion, varying in size up to

about 200 cubic feet. This represents the maximum size with full use of the available materials. However, the reef could be made smaller, if so desired by regulatory and resource agencies, but this would increase costs if a portion of the material is placed in an in-water location and a portion is placed in an upland location. Refer to Figure 3.

The bid specifications for demolition of the Marginal Wharf and construction of the artificial reef will specify that:

- Only clean concrete and clean unpainted unrecycleable embedded steel shall be used for reef construction.
- No portion of the reef shall be greater in elevation than -45' MLLW.
- Material shall be placed in such a manner that the maximum practical interstitial space is created and that the reef structure is stable. Material shall be lowered until it is resting on the sea floor before it is released from crane rigging, not dropped.
- Pile caps shall be placed on the sea floor first and the decking shall be placed on the pile caps and/or on other decking sections.
- Decking sections that rest on the sea floor shall be inclined at an angle no less than 10 degrees from the plane of the underlying sea floor, with the average inclination of all the decking not less than 15 degrees, nor greater than 75 degrees.
- Contractor shall periodically monitor material placement during construction and after construction is completed with underwater video camera to ensure that material is being stacked in such a fashion to provide maximum practical interstitial space and that no part protrudes above -45' MLLW.

The proposed artificial reef would enhance and/or replace fish habitat to offset future EFH impacts associated with replacing the Marginal Wharf. The target species likely be attracted to the reef include greenling, lingcod, rockfish and invertebrates such as starfish, shrimp, crab, octopus, and anemones.

The reef would be approximately 50 to 100 times the size of the artificial reef installed in Smitty's Cove. Placement of different sizes of concrete pieces may provide increased diversity of reef fish assemblages. The reef would be built at varying depths (appr. 60 to 80 feet), which would allow adequate light penetration. It also would provide the agencies the opportunity to monitor colonization of the reef at different depths for use in designing future reefs. This could provide useful information for future design of other artificial reefs in Alaska.

3.3 Monitoring

Monitoring and evaluation are necessary to ensure that the anticipated benefits are derived from the proposed artificial reef. The artificial reef, because of its location within a short drive from Anchorage and its proximity to shore, would facilitate access for monitoring and would also provide a unique research opportunity. ARRC would provide an agreed-upon level of funding for the long-term monitoring effort, and resource agencies would be responsible for conducting or overseeing the monitoring effort.

4.0 ALTERNATIVES

Several alternatives were considered for locating the reef, as described below, along with options for re-use and/or disposal of the concrete.

4.1 Reef Location Alternatives

A properly sited reef can enhance fish habitat, but an improperly sited reef could cause long term problems. Also, it is preferable to use mitigation as near the location of the damage/impact as possible. Artificial reefs built for research and other less user-oriented purposes require siting criteria more specific to those uses.

Five locations for placing the artificial reef were considered: Head of the Bay (in Whittier), Smitty's Cove (in Whitter), Shotgun Cove (east of Whittier), Two Moon Bay near Valdez; and in front of the Marginal Wharf. Their locations are shown on Figure 1. The advantages and disadvantages of these alternatives are summarized on Table 1 and discussed below.

- Head of the Bay is located near a delta at the west end of Passage Canal. This location would be suitable for exploration by recreational divers. However, it is not a viable option due to planned future development in the area and the lack of a suitable location to place the reef. It was also quite far from rocky habitat areas, and therefore, might not be used by fish species. In general, the resource agency personnel at the January 2007 meeting did not support this location. The area is the underwater portion of an alluvial fan fed by at least two watercourses. Deposits from those drainages may gradually cover the reef until it no longer provides habitat. Also, since this area is relatively shallow, it could be difficult to site the reef in an area where it would not pose a risk to small boats.
- Smitty's Cove is a fairly small cove located near Delong Dock, east of the Marginal Wharf. Several small artificial reef structures were placed in the cove in 2006 as mitigation for a nearby project. Resource agencies expressed concern that there was not enough room for another reef in this location, and therefore, it was removed from further consideration.
- Shotgun Cove is located approximately four miles east of Whittier. Of the alternative locations in the Whittier area, this one would be the hardest to access for monitoring and research. It was not supported by the resource agencies as a location for placing the artificial reef due to its mostly pristine nature and the possibility of future development in the cove area by the City of Whittier.
- Two Moon Bay is located near Valdez in Prince William Sound, approximately 75 miles from Whittier. NMFS requested ARRC consider this location because it is an area that needs fish habitat enhancement due to impacts from past activities in the area. ARRC estimates the cost to haul the material to Two Moon Bay at $365,000, considerably more than other alternatives. Also, this site would be more difficult to access for monitoring and research. Therefore, due to the high cost and difficult access, it is not a preferred option.
- In front of Marginal Wharf – This location is approximately 60 feet from and parallel to the Marginal Wharf, and it is the proposed location for placement of the artificial reef. Agency representatives expressed their preference for this location at the January 2007 meeting, as it would enhance /replace fish habitat directly adjacent to the location of the fish habitat that would be lost. This location would minimize costs associated with

transportation, handling, and deployment of the materials. It would also provide convenient access for post-construction monitoring and research opportunities. The only disadvantage to this location is that it would not provide recreational opportunities for divers due to its proximity to ARRC freight barge activities, the state ferry, and other commercial boats.

4.2 *In-water Non-reef Alternatives*

Several in-water non-reef alternatives were considered for use of the concrete from the Marginal Wharf. These included use of the material as fill for harbor expansion, airport improvements (including erosion control for the runway), and the City's proposed boat launch facility at the Head of the Bay. ARRC consulted with an Alaska Department of Transportation and Public Facilities (ADOT&PF) planner who indicated that ADOT&PF does not have any plans for airport improvements in Whittier in the near future. The City of Whittier has not identified any suitable in-water uses for the material.

4.3 *Upland Reuse/Disposal*

Upland reuse of the concrete was also considered. The concrete would need to be used as unclassified fill, which would have to be mixed with a substantial volume of soil to provide a uniform fill, greatly reducing its value as general fill. One option considered was use of the concrete as fill for the proposed fill dock. However, the dock is not currently funded and storage of the material in Whittier for several years is not feasible due to a lack of space in ARRC's yard. Also, storage may not be allowed by the City due to a recent nuisance ordinance enacted within the City limits. In addition, the material is not suitable from an engineering standpoint for use as part of new dock construction. The large chunks of concrete could create substantial voids in the sheet pile wall fill, which could allow the dock surface to settle unexpectedly under heavy load. This alternative was removed from consideration because a suitable use of the material could not be identified. The City of Whittier is evaluating whether it could potentially use some of the material from demolition of the Marginal Wharf as fill.

Another option considered was upland disposal of the concrete on ARRC land in Bear Valley. This alternative would not meet the purpose of the project, which is to enhance or replace fish habitat lost due to construction of a new dock. However, it is a viable option if the material or a portion of the material is not used for construction of an artificial reef.

5.0 DISCUSSION

The proposed artificial reef is an appropriate beneficial re-use of the materials generated during demolition of Marginal Wharf for the following reasons:

- The reef would enhance/replace fish habitat lost when a new dock is constructed to replace the Marginal Wharf. Although the artificial reef would not replicate the habitat that is lost (large armor rocks originally placed to protect the sheet pile wall from scour), it would be similar. Additionally, the habitat replacement would occur very near the area of habitat loss.
- The proposed artificial reef is practical due to the availability of a large quantity of suitable low cost materials near a suitable reef development site. The materials are environmentally safe, structurally and physically stable, and can be deployed by ARRC or its contractors in a cost-effective and safe manner.

- The location identified for the reef is easily accessible for monitoring and research. The use of artificial reefs will likely continue to be proposed mitigation for habitat loss in Alaska, so resource and regulatory agencies need information on the ability of such reefs to replace other habitats. Construction of the proposed artificial reef, therefore, supports research potential as an additional project benefit.
- The proposed artificial reef is consistent with SAFETEA-LU. Section 1805 of SAFETEA-LU (Use of Debris from Demolished Bridges and Overpasses) directs a state to first make debris from the demolition of bridges and overpasses available for beneficial use by a federal, State, or local government, unless such a use obstructs navigation. Beneficial use is defined as shore erosion control or stabilization, ecosystem restoration, and marine habitat creation. SAFETEA-LU does not require that the demolition debris from a dock be made available for "beneficial use" since it is not a bridge or overpass. However, ARRC's proposed use of the material for an artificial reef would help promote the intent of the law.
- The proposed artificial reef is consistent with National Standards identified in the National Fishing Enhancement Act, which promotes and facilitates efforts to establish artificial reefs in the navigable waters of the United States. Section 203 of the Act establishes standards for artificial reef development. Based on the best scientific information available, artificial reefs in waters covered under the Act are to be sited, constructed, monitored, and managed in a manner that will:
  1) enhance fishery resources to the maximum extent practicable;
  2) facilitate access and utilization by US recreational and commercial fishermen;
  3) minimize conflicts among competing uses of waters covered under this title and the resources in such waters;
  4) minimize environmental risks and risks to personal health and property; and
  5) be consistent with generally accepted principles of international law and shall not create any unreasonable obstruction to navigation.

According to the *Guidelines for Marine Artificial Reef Materials* (Gulf and Atlantic States Marine Fisheries Commission, 2004), disadvantages associated with the use of concrete material for artificial reefs are: 1) its heavy weight and the need for heavy equipment to handle it, which increases handling and transportation costs; 2) deployment of large concrete pieces requires heavy equipment at sea, which is hazardous and expensive; and 3) the weight of concrete materials may cause subsidence into the bottom. The first two items are not disadvantages relative to this situation due to the proximity of the proposed artificial reef location near the site where the material will be generated. Also, heavy equipment to handle the material would be needed regardless of whether it would be placed in an upland or in-water location for artificial reef construction. The weight of the material would have the potential to cause some subsidence. However, subsidence is not expected to be a concern in this situation due to the quantity of material that will be used to construct the reef and the proposed mounded configuration, which will facilitate stacking and increase the profile.

Concern has been expressed about the use of artificial reefs as mitigation for loss of dissimilar habitat, even when there are no feasible alternatives. Due to the nature of the Whittier waterfront, it would not be possible to replace like-for-like habitat. As previously mentioned, although the artificial reef would not replicate the habitat that is lost, it would be similar and it

would be located very near the area of habitat loss. Also, several Fishery Management Councils have determined that artificial reefs can be designated EFH (Gulf and Atlantic States Marine Fisheries Commission 2004).

Concern has been expressed that light the depth of the proposed reef would not allow for adequate light transmission, which is important to ensuring the productivity of the reef. The reef would be located in 50 to 70 feet of water; this is within the euphotic zone, which generally extends to a depth of 330 feet. Two artificial reefs placed in 50 to 70 feet of water near Juneau, Alaska have proven to be very effective at attracting marine organisms.

Concern also has been expressed that use of secondary use materials for artificial reef construction, such as concrete generated during a demolition project, may be perceived as ocean disposal rather than artificial reef construction. However, there is a long history of beneficial reuse of secondary concrete materials for artificial reef construction in the US. Many states (Alabama, Texas, Mississippi, New Jersey, Delaware, California) have constructed artificial reefs from concrete rubble over the past 40-50 years with success (see Table 1). These reefs have shown to be stable and very productive (Gulf and Atlantic States Marine Fisheries Commission, 2004). Also, the two artificial reefs in Alaska (Auke Bay) were constructed from secondary materials (cement boats) sunk in 2003 and 2004 are now extremely productive. Furthermore, federal laws promote the beneficial reuse of these materials for marine habitat creation.

The only apparent disadvantage to the proposed artificial reef is its location in an area that would not be conducive to recreational opportunities for divers due to its proximity to ARRC freight barge activities, the state ferry, and other commercial boats.

If the available materials are not used for artificial reef construction, they would be hauled to an upland fill/disposal site, and would no longer be available for artificial reef construction. It would be unfortunate if an opportunity to economically provide such a large quantity of productive habitat is missed due to the false perception of reef building as ocean disposal.

6.0 REFERENCES

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Table 1. Summary of Artificial Reefs Created from Concrete

STATE	COMMENTS
Mississippi	▪ Since 1989, concrete rubble has been placed in 107 locations within 15 permitted reef areas. ▪ Sites include near shore waters 0.25 miles from the mainland in approximately eight feet of water to sites approximately 30 miles offshore in 80 feet of water.
New Jersey	▪ Since 1984, 200,000 cubic yards of concrete demolition debris, including piers, pilings, bridge spans, block, pipes, and foundations, has been placed on New Jersey ocean reef sites. Barge loads of concrete are inspected by state reef personnel to ensure they contain only the concrete and heavy-gauge steel that are allowed. ▪ Concrete is usually deployed by pushing pieces off deck barges with heavy equipment; although dump scows, which drop their entire load at once, are also used occasionally. ▪ Since concrete is very dense and tends to subside into the sand, New Jersey has placed many barge loads of concrete at the same location in an attempt to facilitate stacking, increase profile, and reduce subsidence. ▪ In NJ's experience, concrete provides an effective base for community growth and an intricate maze of hiding places for fish and large crustaceans.
Alabama	▪ Various forms of concrete, including concrete culverts and bridge rubble, have been used in offshore artificial reef building program since early 1970s. ▪ Material is still in place and continues to produce good catches of fish. ▪ Since 1994, concrete culverts, block, and bridge rubble have been used as part of the inshore artificial reef program. This concrete has been used as retaining wall material to hold shell and quarry rock, as well as, alone within the pilings of relic piers. These reefs have all proven to be very productive.
Delaware	▪ Concrete has been the major reef building material for eight estuarine reef sites. Since 1995, over 50 patch reefs have been established on these sites. ▪ Culvert and other manufacturer's second quality material is donated to the program. Only new, clean material is used. ▪ Each patch reef is created by pushing approximately 1,000 tons of concrete off an anchored deck barge. The resulting pile of concrete is from 5 to 15 feet in vertical relief. Piling the material inhibits scouring and subsidence. Concrete placed on sand generally settles slightly during the first year and remains stable thereafter. ▪ Monitoring of concrete patch reefs has shown a 50 to 100 fold increase in invertebrate biomass, compared with the natural bottom.
California	▪ Concrete rubble has been used to build reefs off southern California for the last 40 years. Concrete slabs for demolition projects and pier pilings and decking have been utilized since 1986 to build the largest single artificial reef off the California coastline. ▪ The Bolsa Chica Artificial Reef off Orange County currently consists of 160,000 tons of concrete rubble, with an actual foot print of approximately 30 acres, in a permitted area of 200 acres. It supports much of the commercial passenger fishing boat industry activity operating out of Los Angeles and Long Beach Harbors during several months of the year (citing Dennis Bedford). ▪ During 1992, the first self-sustaining artificial kelp reef was built by the California Department of Fish and Game off Mission Beach, Dan Diego County, using 9,200 tons of concrete slab rubble from the demolition of a local roadway. Covering approximately 11 acres, this reef supports a kelp bed community. ▪ In Fall 1999, Southern California Edison Company built an experimental 22 acre artificial reef off San Clemente, Orange County, designed to support a kelp community. Half of the 48 reef modules are built with concrete rubble.

Source: Guidelines for Marine Artificial Reef Materials (Gulf and Atlantic States Marine Fisheries Commission 2004)

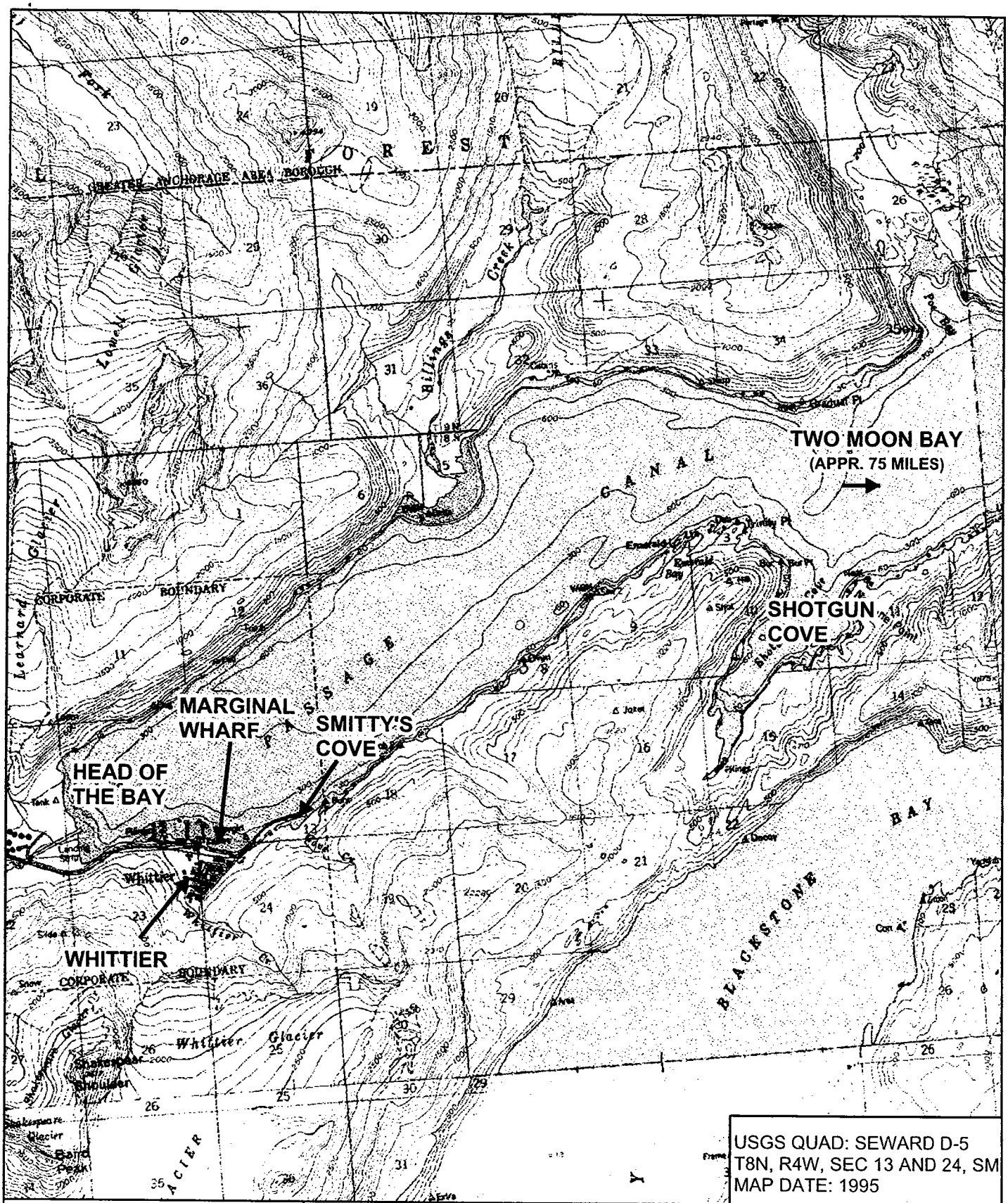
Table 2. Artificial Reef Alternatives

	Cost[a]	Advantages	Disadvantages
Artificial Reef Location			
In front of Marginal Wharf	$95,000	• Enhances fish habitat directly adjacent to habitat likely to be lost during reconstruction of dock. • Site easily accessible for post-construction monitoring and research. • Most cost effective. • Location preferred by regulatory and resource agency representatives at Jan. 2007 meeting	• Would not provide recreational opportunities for divers.
Head of Bay	$140,000	• Would provide recreational opportunities for divers. • Site accessible for post-construction monitoring.	• Future development is unknown and could conflict with an artificial reef. • Far from rocky habitat. • Underwater alluvial fan; sediment accumulation could reduce effectiveness of reef.
Smitty's Cove	$140,000	• Placement near the existing artificial reef would allow easy comparison between the two types of reef materials. • Reef would provide additional recreational opportunities for divers.	• Smitty's Cove is fairly small and placement of a second reef may not be appropriate.
Two Moon Bay	$385,000	• Placement of a reef would help replace habitat lost during past logging operations. • Reef may provide additional recreational opportunities for divers and fishermen.	• High cost to transport concrete from Whittier to Two Moon Bay. • Higher cost to conduct monitoring due to remote location.
Upland Disposal			
Bear Valley	$100,000	• Relatively inexpensive	• Limited beneficial reuse of the material as unclassified fill.

a. Cost is based on the following assumptions: Dock demolition would create 7,000 tons of material; a commonly used work barge can carry 1,500 tons of material including equipment; barge cost is $18,000 per month; tug fee is $6,000 per day; careful placement of the material would cost an additional $15,000 if all of the material is placed at one location. Costs include $5,000 for monitoring during and immediately after construction.

Note: All artificial reefs would cover 40,000 to 70,000 square feet if all of the dock is used to construct the reef.

FIGURES



USGS QUAD: SEWARD D-5
T8N, R4W, SEC 13 AND 24, SM
MAP DATE: 1995

PURPOSE: MARGINAL WHARF REPLACEMENT

PERMIT:

DATUM: ALASKA ALBERS NAD 1927

ADJACENT PROPERTY OWNERS
UPLANDS: N/A
OFFSHORE: N/A

VICINITY MAP

0 2,000 4,000 8,000 Feet

1 inch equals 1.0 miles

ALASKA RAILROAD CORP.
P.O. BOX 107500
ANCH., AK 99510-7500

WHITTIER MARGINAL WHARF

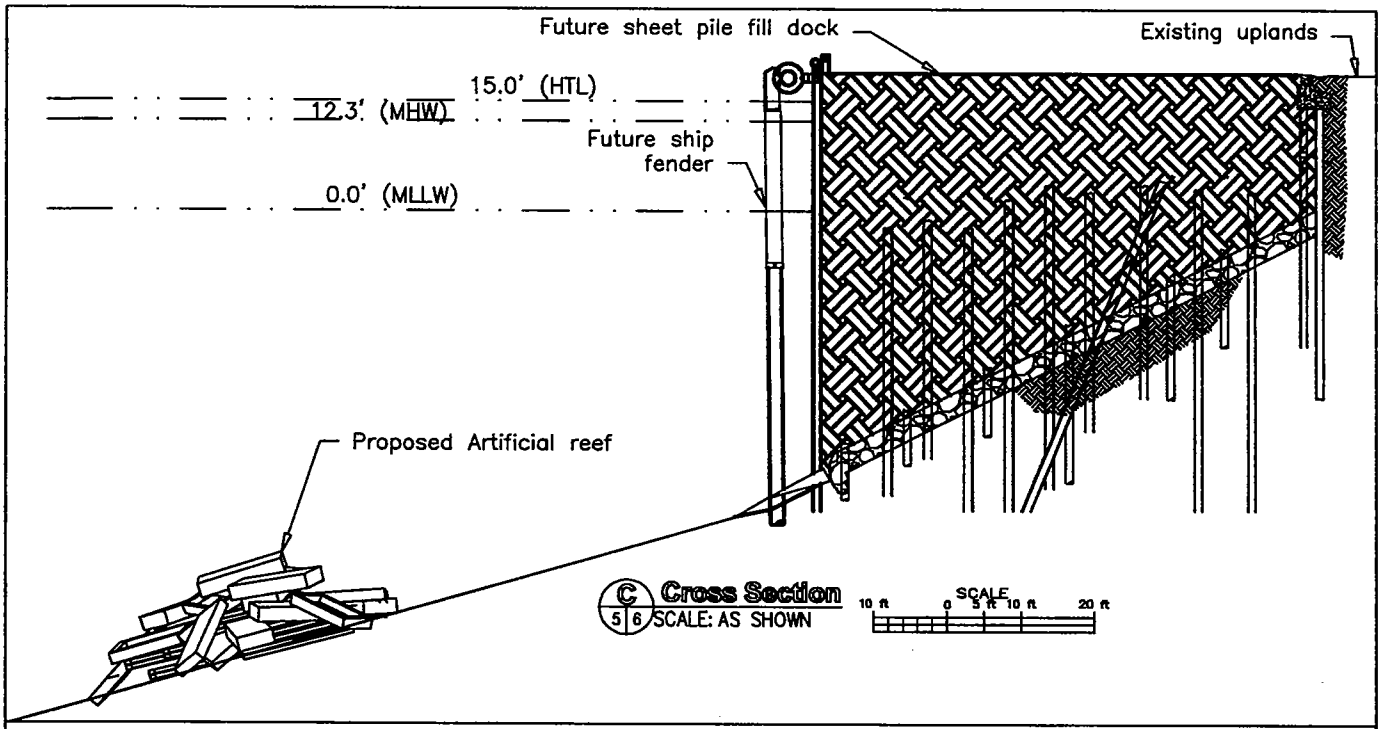
IN: PASSAGE CANAL
AT: WHITTIER

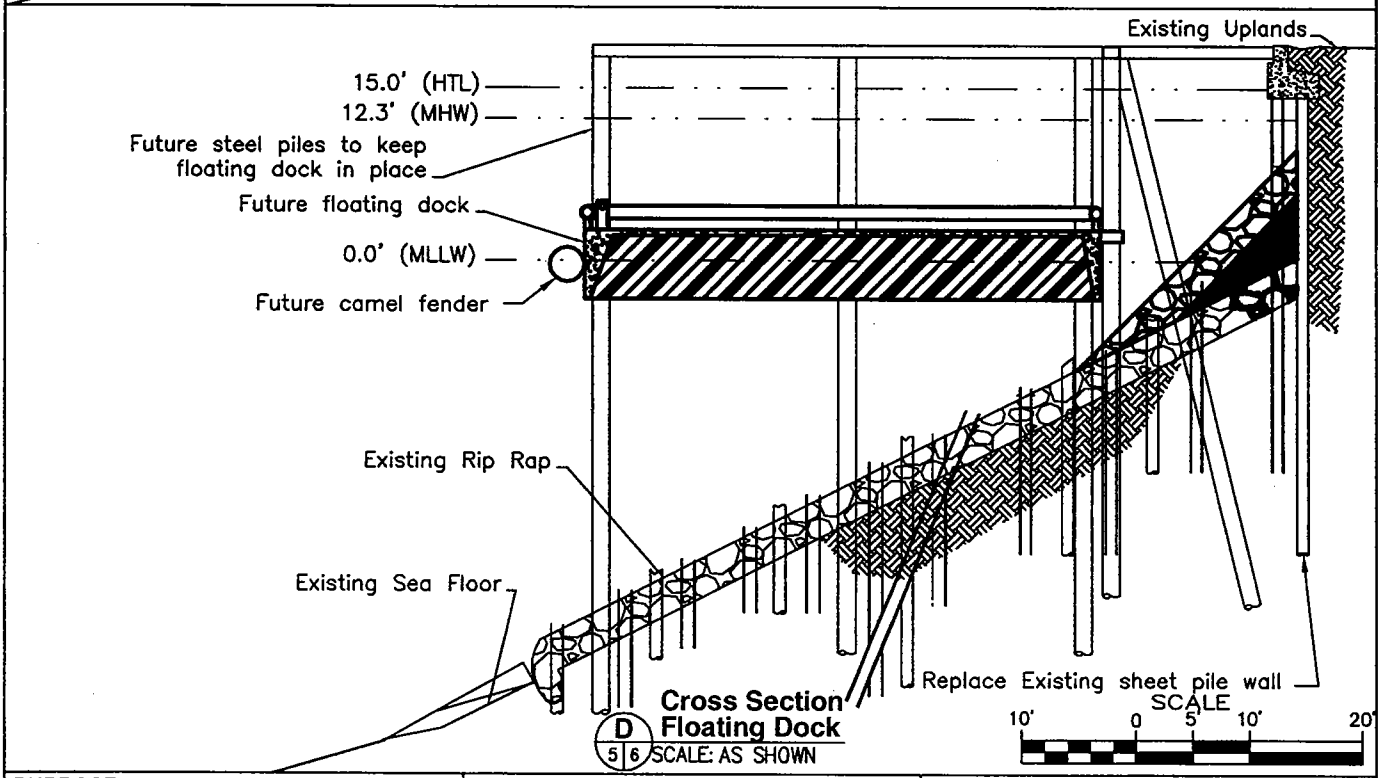
APPLICATION BY:
ROY THOMAS, DIRECTOR
ARRC--ENGINEERING SERVICES

SHEET:

DATE: 3/13/07

REV:





PURPOSE: To demolish Marginal Wharf and construct a new dock in its place

PERMIT:

DATUM: MLLW

ADJACENT PROPERTY OWNERS:
UPLANDS: Alaska Railroad
OFFSHORE: State of Alaska

Marginal Wharf Demolition

COE File Number POA-2006-37-9

ALASKA RAILROAD CORP.
327 W. Ship Creek Avenue
P.O. Box 107500
ANCHORAGE, ALASKA 99510-7500

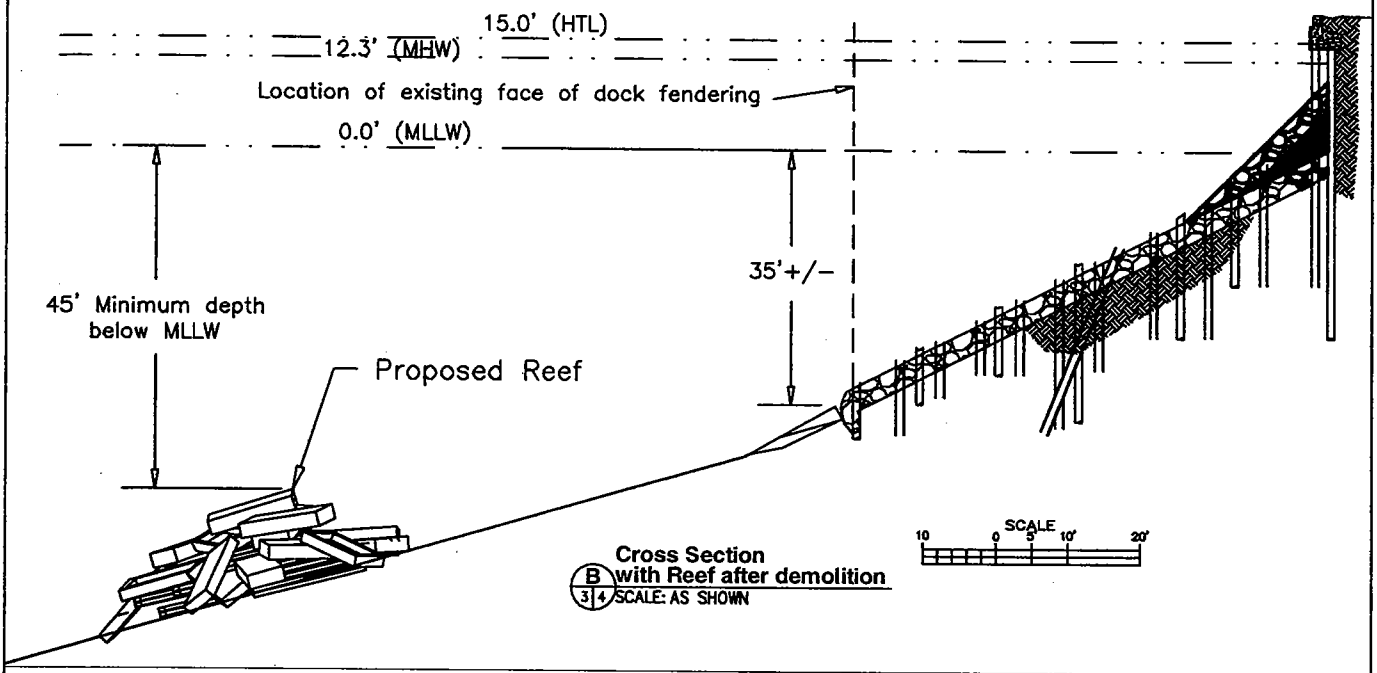
Dock Cross Section

IN: Passage Canal
AT: Whittier
No Borough
APPLICATION BY:
Roy Thomas, Director Engr Svcs
ARRC-ENGINEERING SERVICES
Anchorage, Alaska

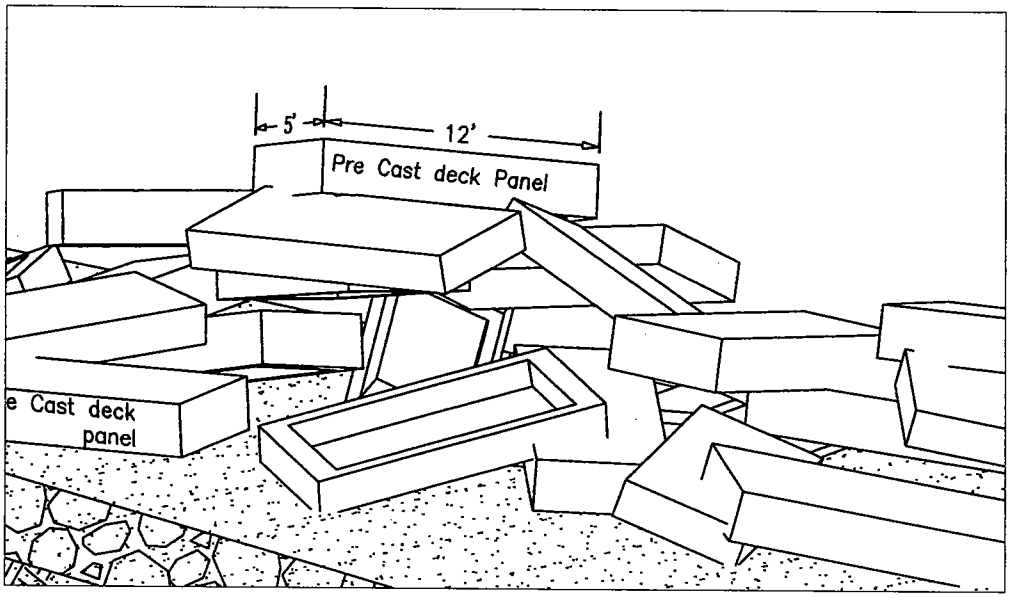
DATE: 03/22/07

U:\ACAD\Eng-Projects\Whittier\Marginal Wharf\Cross sections.dwg

REV.: 0



Cross Section with Reef after demolition
3/4 SCALE: AS SHOWN



3D View of portion of reef

PURPOSE: To demolish Marginal Wharf and construct a new dock in its place

PERMIT:

DATUM: MLLW

ADJACENT PROPERTY OWNERS:
UPLANDS: Alaska Railroad
OFFSHORE: State of Alaska

Marginal Wharf Demolition

COE File Number POA-2006-37-9

ALASKA RAILROAD CORP.
327 W. Ship Creek Avenue
P.O. Box 107500
ANCHORAGE, ALASKA 99510-7500

Reef Details

IN: Passage Canal
AT: Whittier
No Borough

APPLICATION BY:
Roy Thomas, Director Engr Svcs
ARRC-ENGINEERING SERVICES
Anchorage, Alaska

DATE: 03/22/07

REV.: 0

SARAH PALIN, GOVERNOR

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES
OFFICE OF PROJECT MANAGEMENT AND PERMITTING

OFFICE OF PROJECT MANAGEMENT AND PERMITTING
550 WEST 7TH AVENUE, SUITE 705
ANCHORAGE, ALASKA 99501-3559
PHONE: (907) 269-7470/FAX: (907) 269-3981

NOTICE OF APPLICATION
FOR
CERTIFICATION OF CONSISTENCY WITH THE
ALASKA COASTAL MANAGEMENT PROGRAM

Notice is hereby given that a request is being filed with the Office of Project Management and Permitting for a consistency determination, as provided in Section 307(c)(3) of the Coastal Zone Management Act of 1972, as amended [16 U.S.C. 1456(c)(3)], that the project described in the Corps of Engineers Public Notice No. **POA-2006-37-2, Passage Canal**, will comply with the Alaska Coastal Management Program and that the project will be conducted in a manner consistent with that program.

This project is being reviewed for consistency with the Alaska Coastal Management Program. Written comments about the consistency of the project with the applicable ACMP statewide standards and district policies must be submitted to the Office of Project Management and Permitting (OPMP). For information about this consistency review, contact OPMP at the address or phone number above, or visit the ACMP web site at http://www.alaskacoast.state.ak.us//Projects/projects.html.

SARAH PALIN, GOVERNOR

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF WATER
401 Certification Program
Non-Point Source Water Pollution Control Program

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WQM/401 CERTIFICATION
555 CORDOVA STREET
ANCHORAGE, ALASKA 99501-2617
PHONE: (907) 269-7564/FAX: (907) 334-2415

NOTICE OF APPLICATION
FOR
STATE WATER QUALITY CERTIFICATION

Any applicant for a federal license or permit to conduct an activity that might result in a discharge into navigable waters, in accordance with Section 401 of the Clean Water Act of 1977 (PL95-217), also must apply for and obtain certification from the Alaska Department of Environmental Conservation that the discharge will comply with the Clean Water Act, the Alaska Water Quality Standards, and other applicable State laws. By agreement between the U.S. Army Corps of Engineers and the Department of Environmental Conservation, application for a Department of the Army permit to discharge dredged or fill material into navigable waters under Section 404 of the Clean Water Act also may serve as application for State Water Quality Certification.

Notice is hereby given that the application for a Department of the Army Permit described in the Corps of Engineers' Public Notice No. **POA-2006-37-2, Passage Canal**, serves as application for State Water Quality Certification from the Department of Environmental Conservation.

After reviewing the application, the Department may certify there is reasonable assurance the activity, and any discharge that might result, will comply with the Clean Water Act, the Alaska Water Quality Standards, and other applicable State laws. The Department also may deny or waive certification.

Any person desiring to comment on the project, with respect to Water Quality Certification, may submit written comments to the address above by the expiration date of the Corps of Engineer's Public Notice.